# SUCCESS KEY TEST SERIES

X (English)

**(Unit test-4 Science-1 (Ch- 9,10 ))**

Science And Technology - I-

DATE:

TIME: 1 hrs

MARKS: 20

SEAT NO:

**Q.1 A) Solve the following questions.** **(2)**

**1)** Chandrayaan : moon : ..... : Mars

**Ans.** Chandrayaan : moon : **Mangalyaan** : Mars

**2)** ..... contains carbon to carbon single bonds only.

**Ans.** **Alkanes** contains carbon to carbon single bonds only.

**B) Choose the correct alternative and rewrite the sentence** **(3)**

**1)** On adding the pink coloured solution of potassium permanganate to ethanoic acid,
a. the pink colour completely dissapears
b. the pink colour diappears at first
c. the pink colour remains
d. the pink colour changes to orange.

**Ans.** On adding the pink coloured solution of potassium permanganate to ethanoic acid, **the pink colour remains**

**2)** Magnesium is a moderately active metal. Which is not true in the following?
a. It reacts with bromic acid to liberate hydrogen gas.
b. It reacts with ethanol and hydrogen gas is not liberated.
c. Magnesium has two valence electrons.
d. On combustion, magnesium forms a powder of MgO.

**Ans.** Magnesium is a moderately active metal. Which is not true in the following? **It reacts with ethanol and hydrogen gas is not liberated.**

**3)** Which of the following astronauts travelled through space shuttle 'Discovery' first time?
a. Kalpana Chawala b. Rakesh Sharma c. Sunita Williams d. Neil Armstrong

**Ans.** Which of the following astronauts travelled through space shuttle 'Discovery' first time? - **Sunita Williams**

**Q.2 Solve the following questions. (Any two)** **(4)**

**1)** The unsaturated compounds are more reactive than the saturated compounds.

**Ans.** i. The valencies of all the carbon atoms in saturated hydrocarbons are fully satisfied by single bonds.
ii. Single bonds are very strong and hence remain less reactive.
iii. The carbon compounds having a double bond or triple bond between two carbon atoms are called unsaturated compounds.
iv. Double and triple bonds are comparatively weaker.
v. Therefore, The unsaturated compounds are more reactive than the saturated compounds.

**2)** Complete the statement and explain the following:
The Initial velocity of the Mangalyaan must be greater than …… from earth.

**Ans.** The Initial velocity of the Mangalyaan must be greater than **escape velocity** from earth.
**Explanation**:- If the satellite is to travel beyond the gravitational pull of earth its velocity must be more than the escape velocity from the earth.

**3)** What does space debris consist of?

**Ans.** Space debris consist of the following:
i. Non functional satellite.
ii. Parts of launcher detached during launching.
iii. Debris generated due to collision of satellite with other satellite.
iv. Other object in space.

**Q.3 Solve the following questions. (Any two)** **(6)**

**1)** There are astronomical object orbiting planet of our solar system.

1. According to you, what that object is known as?

2. Is it possible for man to make this object? If yes, what is it called?

3. Explain in detailed about man made astronomical object.

**Ans.** 1. Astronomical object orbiting planet of our solar system is called as satellite.

2. Man made astronomical object is known as artificial satellite.

3.

i. A man made object orbiting the earth or any other planet in a fixed orbit is called artificial satellite.
ii. Satellites work on Solar energy.
iii. Photovoltaic panels are attached on both sides of the satellite, which look like wings.
iv. Satellites are installed with various transmitters and other equipment's to receive and transmit signals between earth and satellite.

**3)** How much time will the satellite take to complete one revolution around the earth?

**Ans.** Given :
R : 6400 km = $6.4 \times 10^6$ m
h : 35780 km = $3.5780 \times 10^7$ m
$u_c$ : 3.08 km / s = $3.08 \times 10^3$ m/s
T = ?
The time required for the satellite to complete one revolution around the earth.

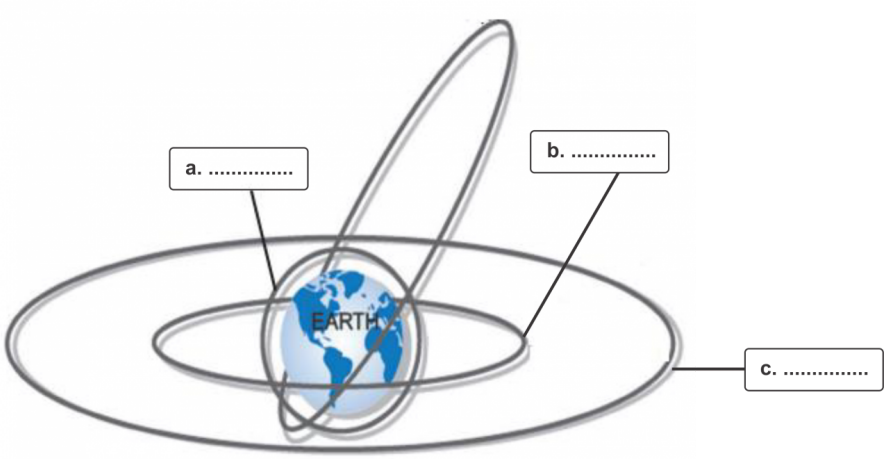
$$T = \frac{2\pi (R + h)}{u_c}$$

$$= \frac{2 \times 3.142 \times (6.4 \times 10^6 + 35.78 \times 10^6)\text{m}}{3.08 \times 10^3 \text{ m/s}}$$

$$= \frac{6.284 \times 42.18 \times 10^3}{3.08}\text{s}$$

= Approx 86060 s
**= 23 hours 54 minutes 20 seconds.**

**2)** Write the proper name of the orbits of satellites shown in the following figure with their height from the earth's surface.

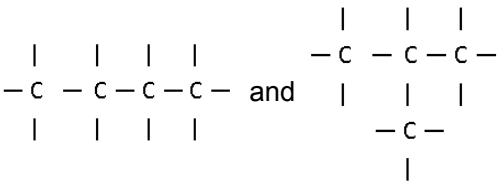



**Ans.** i. low earth orbits
height above the earth's surface: 180 km to 2000 km
ii. Medium earth orbits
height above the earth's surface: 2000 km to 35780 km
iii. high earth orbits
height from the earth's surface > 35780 km

**Q.4 Solve the following questions. (Any one)** **(5)**

**1)** Explain the following terms with example.
a. Structural isomerism b. Covalent bond c. Hetero atom in a carbon compound d. Functional group e. Alkane

**Ans.** i. **Structural isomerism.**
The phenomenon in which compounds having different structural formulae and same molecular formula. This is called as structural isomerism.
**For example :** Two structures of $C_4H_{10}$:




ii. **Covalent bond.**
The chemical bonds formed by sharing of two valence electron between the two atoms is called covalent bond.
It can be shown by electron dot structures.
**Example :-**
Hydrogen molecule - H : H
Oxygen molecule - :O:O:

iii. **Hetero atom in a carbon compund.**
The atom of the element which is substitute for hydrogen in hydrocarbon is referred to as a hetero atom.
**Example :**
$\left(\begin{array}{c} -N-H \\ | \\ H \end{array}\right)$ - Amine
- COOH - Carboxylic acid

iv. **Functional group.**

The carbon compunds containing hetero atoms or groups, these groups are called functional groups.

**Example :**

-X - Halogen (Cl, Br, I)

-OH - Alcohol.

v. **Alkane**

Hydrocarbon compounds having single bond are saturated compound. The example is alkane.

**Example :**

Methane - $CH_4$

Ethane - $C_2H_6$

**2)** Identify the type of the following reaction of carbon compounds.

i. $CH_3\text{-}CH_2\text{-}CH_2\text{-}OH \rightarrow CH_3\text{-}CH_2\text{-}COOH$

ii. $CH_3\text{-}CH_2\text{-}CH_3 \rightarrow 3\ CO_2 + 4\ H_2O$

iii. $CH_3\text{-}CH = CH\text{-}CH_3 + Br_2 \rightarrow CH_3\text{-}CHBr\text{-}CHBr\text{-}CH_3$

iv. $CH_3\text{-}CH_3 + Cl_2 \rightarrow CH_3\text{-}CH_2\text{-}Cl + HCl$

v. $CH_3\text{-}CH_2\text{-}CH_2\text{-}CH_2\text{-}OH \rightarrow CH_3\text{-}CH_2\text{-}CH{=}CH_2 + H_2O$

vi. $CH_3\text{-}CH_2\text{-}COOH + NaOH \rightarrow CH_3\text{-}CH_2\text{-}COO\text{-}Na^+ + H_2O$

vii. $CH_3\text{-}COOH + CH_3\text{-}OH \rightarrow CH_3\text{-}COO\text{-}\ CH_3 +\ H_2O$

**Ans.**

i. $CH_3\text{-}CH_2\text{-}CH_2\text{-}OH \rightarrow CH_3\text{-}CH_2\text{-}COOH$ - **Oxidation**

ii. $CH_3\text{-}CH_2\text{-}CH_3 \rightarrow 3\ CO_2 + 4\ H_2O$ - **Oxidation**

iii. $CH_3\text{-}CH = CH\text{-}CH_3 + Br_2 \rightarrow CH_3\text{-}CHBr\text{-}CHBr\text{-}CH_3$ - **Addition**

iv. $CH_3\text{-}CH_3 + Cl_2 \rightarrow CH_3\text{-}CH_2\text{-}Cl + HCl$ - **Substitution**

v. $CH_3\text{-}CH_2\text{-}CH_2\text{-}CH_2\text{-}OH \rightarrow CH_3\text{-}CH_2\text{-}CH{=}CH_2 + H_2O$ - **Dehydration**

vi. $CH_3\text{-}CH_2\text{-}COOH + NaOH \rightarrow CH_3\text{-}CH_2\text{-}COO\text{-}Na^+ + H_2O$ - **Neutralization**

vii. $CH_3\text{-}COOH + CH_3\text{-}OH \rightarrow CH_3\text{-}COO\text{-}\ CH_3 +\ H_2O$ - **Esterification**